



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/667,807	09/22/2000	MARK A. DARTY	104175	9676

25944 7590 08/25/2004

OLIFF & BERRIDGE, PLC  
P.O. BOX 19928  
ALEXANDRIA, VA 22320

EXAMINER

ALPHONSE, FRITZ

ART UNIT	PAPER NUMBER
----------	--------------

2133

DATE MAILED: 08/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/667,807

Applicant(s)

DARTY, MARK A.

Examiner

Fritz Alphonse

Art Unit

2133

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11 May 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20,23-25 and 36-87 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-11,16-18,23-25,36-69,73-75 and 77-87 is/are rejected.
- 7) ☒ Claim(s) 12-15,70-72 and 76 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 75, 78-79, 81-83, 85, 86 are rejected under 35 U.S.C. 102(e) as being anticipated by Hattori.

As to claim 75, Hattori discloses a display apparatus, comprising: at least one image display pixel that includes: at least one cavity (microcapsule (10) forming a cavity) disposed between a first electrode (14 on top) and a second electrode (14 at the bottom), at least one of the first electrode and the second electrode (14) being transparent (col. 4, lines 16-22), the at least one cavity including at least one single-color colorant particle (note the color colorant particles 2 b) disposed and movable within the at least one cavity, the at least one single-color colorant particle (2 b) having a single charge polarity (col. 4, lines 65 through col. 5 line 2), the at least one cavity achieving a display contrast change independent of at least another cavity forming at least another image display pixel (col. 9, lines 37-39).

As to claims 78-79, Hattori discloses a display apparatus, wherein the at least one single color colorant particle having a coating that prevents at least one of a charge

Art Unit: 2133

leakage and a particle agglomeration, and wherein the coating including a surfactant (col. 5, lines 5-17).

As to claims 81-83, Hattori (figs. 6, 8) show a display apparatus, wherein the at least one single-color colorant particle includes at least two colorant particles that are each single-color and that each have a single charge polarity (note colorant particles 2a, 2b with a single charge polarity), the at least two particles being disposed and movable within the same cavity. Hattori teaches that two colorant particles have different colors and different charge polarities (col. 4, lines 65 through col. 5 line 2).

As to claim 85, Hattori (fig. 1) a method of providing contrast change at least one channel that forms a display pixel in the display of an image, comprising: moving at least one single-color (note in fig. 6, the motion of 2b), single charge particle disposed within the at least one channel along a direction of extension of the at least one channel by use of an electric field (note in figures 6 and 8, different movement directions of particles 2a and 2b inside the capsules due to an applied electric field; see figure 9), the channel having at least one end bounded by a substrate having a different color than a color of the at least one single-color, single charge particle (note in Hattori the two different colors (2a, 2b) of the particles), the least one channel that forms the display pixel achieving a display contrast change independent of at least another channel that forms another display pixel (see figure 6).

As to claim 86, the claim has substantially the limitations of claim 85; therefore, they are analyzed as previously discussed in claim 85 above.

*Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-10, 23-25, 36-37, 42, 46-51, 54-69, 73-74, 84, 87 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori (U.S. Pat. No. 6,025,896) in view of Gordon (U.S. Pat. No. 6,184,856).

As to claim 1, Hattori (fig. 1) shows a display device comprising: a carrier body that defines at least one channel (note the microcapsule (10) forming a channel); at least one particle (2a, 2b) disposed in the at least one channel (10); and a controller (Hattori teaches about a controlling electric field) that moves the at least one particle along the direction of extension of the at least one channel (col. 7, lines 22-26).

Hattori (fig. 1) does not show one channel extending in a direction of extension.

However, in the same field of endeavor, Gordon (figs. 1, 2) shows a display device comprising a plurality of channels (note cells 14, 16 and 18), which extend in a direction of extension.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Hattori's display device with the transmissive electrophoretic display, as disclosed by Gordon. Doing so would provide a transmissive electrophoretic color display possessing low-power color display with high brightness, wide viewing angle, and large color gamut (col. 2, lines 57-63).

Art Unit: 2133

As to claim 2, Hattori (fig. 1) discloses a display including a first cover (first transparent substrate 14) disposed at a first end of the at least one channel, and a second cover (second transparent substrate 14) disposed at a second end of the at least one channel, the first and second covers preventing the at least one particle from exiting the at least one channel.

As to claims 3-4, Hattori (fig. 1) discloses a display, further including a lens disposed at a surface of a second cover (note in Hattori, the two substrates 14 are used as cover).

As to claim 5, Hattori (fig. 1) discloses a display further including a fluid (note the liquid dispersion medium 4; col. 4, lines 21-25) disposed in the at least one channel (10), and the first and second covers (14) being affixed at the first and second ends of the at least one channel to prevent the fluid from exiting the at least one channel.

As to claim 6, Hattori (fig. 1) discloses a display device, wherein at least one particle includes multiple particles.

As to claim 7, Hattori does not disclose one channel including multiple channels that define an array.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Hattori's display device with the transmissive electrophoretic display, as disclosed by Gordon. Doing so would provide a transmissive electrophoretic color display possessing low-power color display with high brightness, wide viewing angle, and large color gamut (col. 2, lines 57-63).

However, the limitation is clearly disclosed by Gordon (note in fig. 1a, channel 26 includes channels 14, 16 and 18)

Art Unit: 2133

As to claim 8-10, Hattori (fig. 1) discloses a display, wherein at least one particle is a solid, a liquid, and micro-encapsulated (col. 4, lines 58-64).

As to claims 23-25, method claims 23-25 correspond to apparatus claim 1. Therefore, they are analyzed as previously discussed in claim 1 above.

As to claims 36-37, Hattori (fig. 1) teach about one particle (2b) that provides maximum color reflection when disposed at a second end (top end) of the at least one channel, and provides minimum color reflection when disposed at a first end (bottom end) of the at least one channel; and wherein the minimum color reflection is not appreciably visible to the human eye.

As to claim 42, Hattori (fig. 1) shows a display, wherein the multiple particles including at least two single-color colorant particles (2a, 2b) in the same channel (10), the at least two single-color colorant particles having different colors.

As to claim 46, the claim has substantially the limitation of claim 7; therefore, it is analyzed as previously discussed in claim 7 above.

As to claim 47, Hattori teaches that each of the multiple channels only housing one particle selected from the group consisting of cyan particles, yellow particles, magenta particles, red particles, green particles, blue particles, black particles and white particles (note that Hattori teaches various dyes can be cited as examples of the coloring matter (colorant) for the polymerization particles; see col. 7, lines 8-9).

As to claims 48-49, Hattori (fig. 1) discloses a display, wherein each of the multiple channels housing at least two particles, and at least two particles including at least two single-color colorant particles that have different colors.

Art Unit: 2133

As to claims 50-51, Hattori (figs. 1, 6) discloses a display, wherein the at least one particle being a single-color colorant particle (note particles 2a, 2b). The at least one single-color colorant particle being at least one member selected from the group consisting of at least one black particle (2b) and at least one white particle (2a).

As to claims 54-57, Hattori (figs. 1, 6) discloses a display, wherein at least one particle having a single charge polarity (note the movement of particles fig. 6), and wherein at least one particle including at least two particles having a single charge polarity (col. 4, lines 65 through col. 5 line 2).

As to claims 58-62, Hattori (figs. 1, 6) discloses a display, wherein at least one particle being a single-color colorant particle; the at least one particle having a single charge polarity such that the at least one particle is movable along the direction of extension of the at least one channel by application of an electric field. In addition, Hattori teaches at least one particle including at least two single-color colorant particles; the at least two single-color colorant particles having different colors (see figures 6; col. 4, lines 65 through col. 5 line 2).

As to claim 63, Hattori (fig. 1) discloses a display, wherein the at least one particle including at least two particles having a single charge polarity.

As to claim 64, Hattori (fig. 6) shows a display, wherein a first one of the at least two particles having a charge polarity that is different than the charge polarity of a second one of the at least two particles (note the polarity of particles 2a, and 2b) such that the at least two particles can be moved in different directions along the direction of extension of the at least one channel.



Art Unit: 2133

As to claim 65, the claim has substantially the limitations of claim 7; therefore, it is analyzed as previously discussed in claim 7 above.

As to claims 66-68, Hattori (fig. 1) discloses a display, at least two of the multiple channels defining a display pixel, and wherein at least one particle including at least two single-color colorant particles, and wherein at least two single-color colorant particles having different colors.

As to claim 69, Hattori (fig. 6) shows a display, wherein each one of the at least two single color colorant particles (2a, 2b) having a single charge polarity such that each one of the at least two single-color colorant particles is independently movable by application of an electric field (see figure 8).

Gordon does not explicitly disclose colorant particles is independently movable along the direction of extension. However, the limitation is disclosed by Gordon (col. 1, lines 50-59). See the motivation related to claim 1.

As to claims 73-74, the claims have substantially the limitations of claim 69; therefore, they are analyzed as previously discussed in claim 69 above.

As to claim and 84 and 87, method claims 84 and 87 correspond to apparatus claim 1; therefore, they are analyzed as discussed in claim one above.

5. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori in view of Gordon as applied to claim 1 and further in view of Palmer (U.S. Pat. No. 6,052,287).

As to claim 11, Hattori and Gordon do not provide a carrier body partially made of silicon.

Art Unit: 2133

However, in the same field of endeavor, Palmer discloses an integrated circuit chip carrier formed from a silicon substrate (see abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Palmer's integrated circuit chip carrier with Hattori. By doing so the silicon array chip carrier can serve as an additional heat sink or a thermal stress absorber when an IC chip is to be interfaced with a material such as a glass epoxy printed circuit board.

6. Claims 52-53 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori in view of Gordon and further in view of Sheridan (U.S. Pat. No. 4,126,854).

As to claim 52-53, Hattori and Gordon do not provide one or two-single color colorant particles with different color. However, this limitation is disclosed by Sheridan (col.3, lines 55-58).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to improve upon the twisting ball panel display, as disclosed by Sheridan. By doing so, the ambient light incident upon the display will provide a visible image.

7. Claims 38-41, 43-45, 77, 80 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori in view of Gordon and further in view of Albert (U.S. Pat. No. 6,300,932).

As to claims 38-41, Hattori does not teach about "multiple particles including at least one cyan particle, at least one yellow and at least one magenta particle".

However, in the same field of endeavor, Albert discloses an electrophoretic display device having multiple particles including one cyan, yellow and magenta particle (col. 8, lines 55-67).

Therefore, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, to improve upon the electrophoretic display device, as disclosed by Albert. Doing so would improve the uniformity and quality of the display.

As to claims 43-45, the claims have substantially the limitations of claims 38-39. Therefore, they are analyzed as previously discussed in claims 38-39 above.

As to claims 77 and 80, Hattori does not disclose a dielectric fluid disposed in the at least one cavity of a display apparatus. However, this limitation is clearly disclosed by Albert (col. 15, lines 45-53). See the motivation above.

8. Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hattori in view of Gordon as applied to claim 1 above, and further in view of Nakamura (U.S. Pat. No. 3,826,949).

As to claims 16-18, Hattori and Gordon do not disclose a controller including an electrode ring disposed at one of a first end of the at least one channel and a second end of the at least one channel. However, the limitations are clearly disclosed by Nakamura (see figure 11, col. 8, lines 25-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to combine Hattori's display device with Nakamura. Doing so would provide a method of making a display device which displays letters, figures, patterns and the like in small size clearly.

Art Unit: 2133

*Allowable Subject Matter*

9. Claims 12-15, 19-20, 70-72, 76 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

*Response to Arguments*

10. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

*Response to Arguments*

11. Applicant's arguments, see interview summary, filed 5/11/04, with respect to claims 1-20, 23-25 and 36-87 have been fully considered and are persuasive. The last Office Action mailed 4/14/04 has been withdrawn. In view of the last amendment, the reference of Gordon, II et al. has been added for new ground of rejection.

*Conclusion*

12. Any response to this action should be mailed to:

Commissioner of Patents and Trademarks, Washington, D.C. 20231

**or faxed to:** (703) 872-9306 for all formal communications.

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Fourth Floor (Receptionist).

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fritz Alphonse, whose telephone number is (703) 308-8534. The examiner can normally be reached on M-F, 8:30-6:00, Alt. Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert De Cady, can be reached at (703) 305-9595.

Art Unit: 2133

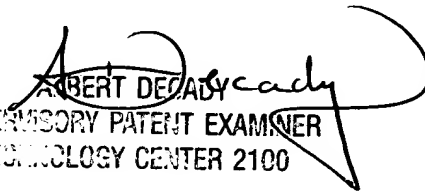
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 305-3900.

Information regarding the status of an application may also be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Fritz Alphonse

Art Unit 2133

August 16, 2004

  
ALBERT DECADY  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100